

Name:

Date:

Exam: Function Reflections (EXAM version 623)

1. (worth 9 points) Let function f be defined by the polynomial below:

$$f(x) = 7x^4 + 8x^3 - 5x^2 - 6x - 2$$

Draw lines that match each function reflection with its polynomial:

Reflections

Polynomials

$f(-x)$ •

• $-7x^4 + 8x^3 + 5x^2 - 6x + 2$

$-f(x)$ •

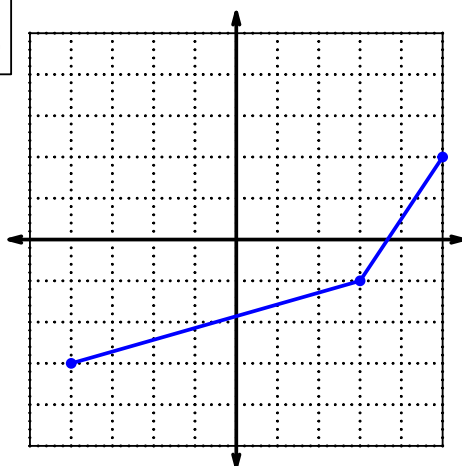
• $-7x^4 - 8x^3 + 5x^2 + 6x + 2$

$-f(-x)$ •

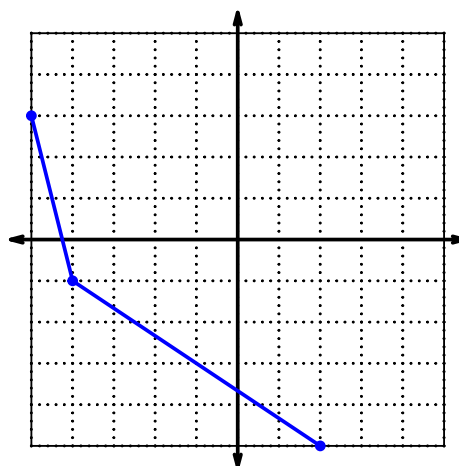
• $7x^4 - 8x^3 - 5x^2 + 6x - 2$

2. (worth 20 points) In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.

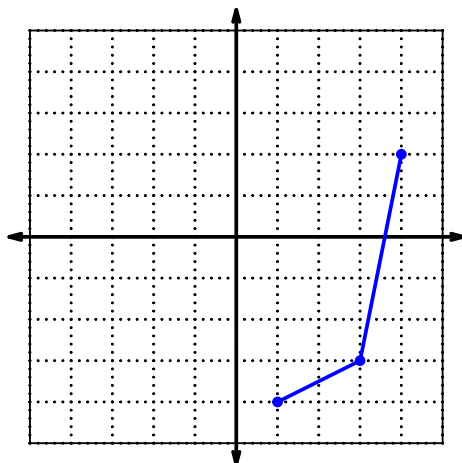
• $y = g(x)$
• $y = -g(-x)$



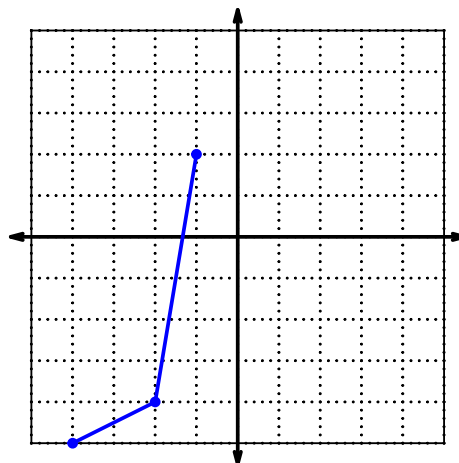
• $y = h(x)$
• $y = h(-x)$



• $y = m(x)$
• $y = m^{-1}(x)$



• $y = p(x)$
• $y = -p(x)$



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For all questions on this page, the functions f , g , and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	8	5	9
2	4	1	5
3	9	9	6
4	1	6	8
5	6	4	7
6	7	2	4
7	3	8	1
8	5	3	2
9	2	7	3

3. (worth 3 points) Evaluate $h(1)$.

4. (worth 3 points) Evaluate $f^{-1}(5)$.

5. (worth 3 points) Assuming g is an **odd** function, evaluate $g(-3)$.

6. (worth 3 points) Assuming h is an **even** function, evaluate $h(-7)$.

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7. (worth 15 points) A function, f , is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g , is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = -x^2 + 1$$

- a. Express $p(-x)$ as a polynomial in standard form.

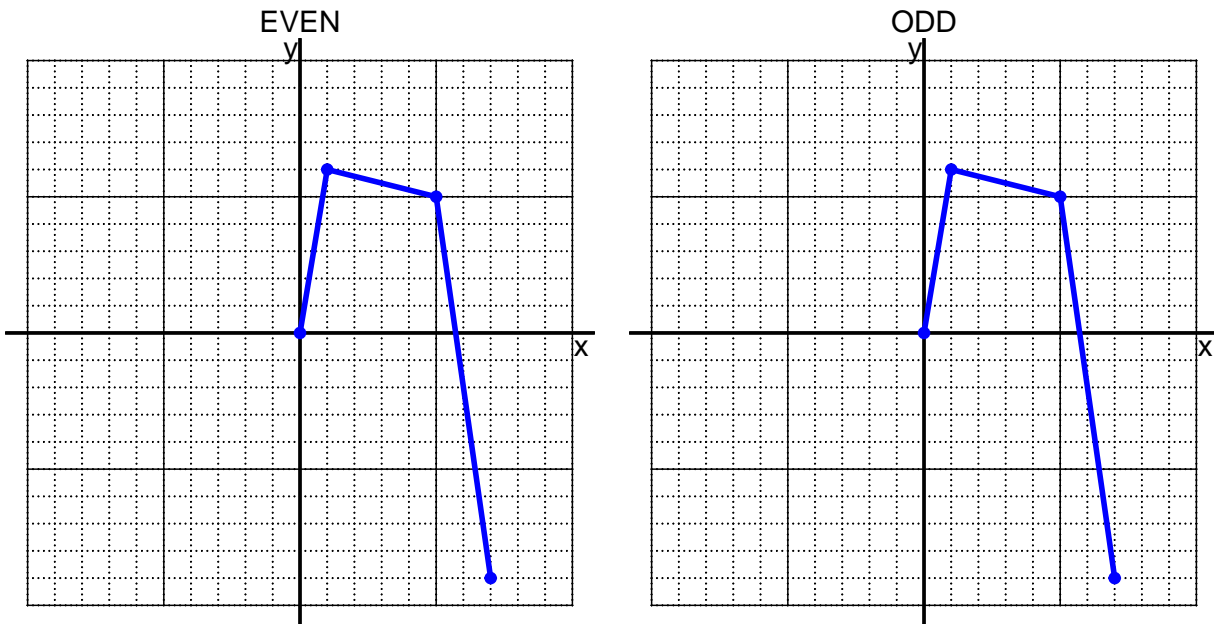
- b. Express $-p(-x)$ as a polynomial in standard form.

- c. Is polynomial p even, odd, or neither?

- d. Explain how you know the answer to part c.

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8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.



9. (worth 10 points) Let function f be defined with the equation below.

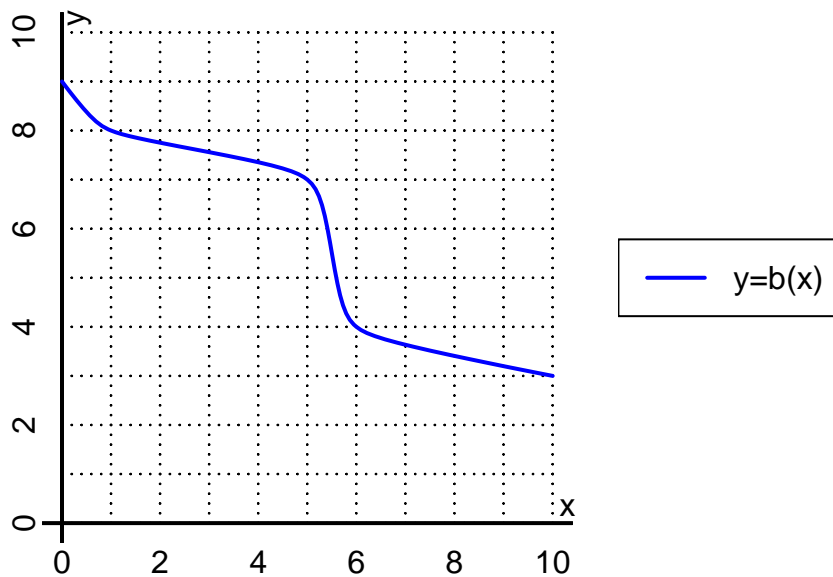
$$f(x) = \frac{x-3}{7}$$

a. Evaluate $f(17)$.

b. Evaluate $f^{-1}(13)$.

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10. (worth 6 points) The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(6)$.

b. Evaluate $b^{-1}(7)$.

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11. (worth 18 points) Function f is defined by the table below.

a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-6			
-1	-3			
0	0			
1	3			
2	-6			

b. Is function f even, odd, or neither?

c. How do you know the answer to part b?